

**How to sell the message “Road maintenance is necessary”
to decision makers**

by

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Summary

Roads are of vital importance in order to make a nation grow and develop. Especially in the third world, good maintained roads also will enhance poverty reduction by improving access between regional and rural communities and, ultimately, enhancing socio-economic growth and development. Road networks form vital links between production centres and markets. In addition its multiple function of providing access to employment, social, health and education services makes road network crucial in fighting against poverty by opening up more areas and stimulating economic and social development.

There is a problem, however, which is common throughout the world, the neglect of maintaining our roads. Building new roads cost money, but without maintaining the roads properly, they deteriorate very quickly. If nothing is done, roads with a design life of decades can need replacing or major repair work after just a few years.

That deterioration will very fast infect road transport in general where the costs will soar, which again will infect the economy of the transporters. The transporters will transfer their expenses to the customers and the economy of the whole country will suffer. As the road network deteriorates, the whole country loses major assets build up over years, assets created with vast amounts of money, time and effort.

Yet even small budgets for maintenance make a difference with proper planning and the right priorities. The situation in many countries concerning the road condition is not only urgent, it is critical. It is important to know the costs involved in road maintenance and the costs of not maintaining the roads. The money which is saved in the maintenance budget by not maintaining the roads, is ultimately paid by the users and the society. I will call it the invisible tax, and the total cost to the economy is huge.

In most countries it is believed to be a political benefit to be in favour of investing money in building new roads. However, maintenance does not have the same status or does not give the same opportunity to stake holders or decision makers to present themselves to the public. Something has to be done with this situation. We as professional people have to sell the message that maintaining roads are of decisive importance for a country.

We have to create a platform for politicians and other decision makers where they can operate and get political benefit from arguing about the importance of maintaining the roads. It is also important to involve the local communities and the users which are those who first will experience the result of bad roads.

I also think the Technology Transfer Centres should play an important role in dissemination of information about the consequences of neglecting the maintenance sector and present good and practical solutions for proper maintenance.

General

An efficient transportation system is of vital importance for the development of a country. This includes both the public and the private sector, which will again prepare a good basis for a country's value increase. It is therefore an imperative for all countries to have a transport policy, which will secure public services and encourage trade and industry in all parts of the country. In such a policy it is especially important to take care of the investment the roads represent and maintain them well and by that also increase the traffic safety.

If we look at the traffic accidents in Norway, we estimate the social cost of a fatal accident to be approx. 2. mill. US dollars. This estimated cost for a traffic accident differs from country to country, but nevertheless, one of the really large problems we have in the world today is all the lives lost in traffic accidents. It is therefore a national policy all over the world to prevent all this fatalities and problems and costs to the society. Good maintenance is a very important factor in attaining these objectives.

In order to maintain the quality of life in the rural areas, which is of importance in order to have balanced demographics, roads are more or less decisive. In all parts of the world we see that people are moving from rural areas to densely built-up areas. In most countries there is a policy of encouraging people to develop the rural areas and by doing so avoid the problems of too fast urbanization. National trunk roads keep a country together and secure that trade and industry flourish throughout the country. Good roads also make a country more competitive both nationally and internationally. In order to establish an efficient road system, it is important to find a right balance between using money on construction or on maintenance and operation of the roads.

Of these activities, road maintenance is most vital, a "lesson learned the hard way" by most countries throughout the world. The road maintenance has been neglected in the past. This problem is not only limited to the situation with roads. Apparently, people in power think that prioritising new constructions, new buildings or whatever, will result in political benefit and increased attention from the public, especially from the voters.

In this presentation I will discuss a plan for making road maintenance an arena where politicians can market themselves to the public and the voters. I will also discuss the possibility to use the Technology Transfer Centres in this process and how to involve the local communities and also the users of the roads. The Technology Transfer Centres can be an efficient partner in transferring technology.

Examples of neglecting maintenance

I know there are many examples from countries all over the world of the direct cost of neglecting maintenance. I have chosen some from my own country and from the countries in Africa where I have been working. The first example I have chosen is from my own country, Norway

In Oslo, Norway a bridge deck did not have adequate waterproof membrane. It could have been done as a simple job for a cost of approximately 0.6 million US dollars. The job was not given preference to and was therefore not done. The result was that the whole bridge after some years had to be torn down and replaced by a new bridge.

The total cost for the new bridge was 15 million US dollars. In addition came the cost for the users, because they had to travel on lengthy detours for a long period of time.

In Kenya, years of inadequate maintenance left the main Nairobi – Mombasa road highly vulnerable. In 1997 heavy rain damaged two bridges and several sections of the road. The result was that the users experienced months of national disruptions as long stretches of the road became unusable in the rains and very difficult in dry weather.

In Tanzania, failure to improve a simple stream crossing caused damage to 3 kilometres of road – and led to lengthy delays. The result was a bill five times higher than would have been needed to make the original repair.

In most SADC countries, a substantial proportion of the road network, typically more than 75%, consists of gravel and earth roads. These relatively low volume roads often fulfill a potentially vital socio-economic function, not only by providing access to rural areas where the bulk of the population live, but also by connecting the productive agricultural areas to the primary road network.

Unfortunately, however, despite their vital importance to the well being of the communities that they serve, rural roads in many SADC countries suffer from a number of inherent problems. They often become impassable during the rainy season, gravel wearing courses are abraded by traffic and the weather, dust clouds develop in dry conditions, frequent bladings by motor grader are required to restore riding quality, and regular regravelling places an unsustainable demand on natural resources.

There are developed methods, cheap, simple methods of surfacing gravel roads with a bitumenous layer. I will come back to that later in my presentation.

In Sub-Saharan Africa 150 billion US dollars was spent in 3 decades building roads. Maintenance was neglected and a third of that investment has now been lost. The result is that 50 billion US dollars of key national assets are gone.

A recent analysis of how 85 countries allocated road maintenance funds showed that, spending 12 billion US dollars on preventive maintenance would have eliminated reconstruction costs of 40 billion US dollars. The result is that an average net cost of 330 million US dollars, are wasted on avoidable reconstruction in each country.

A new road is expensive. In my country a two-lane paved new road costs about 0,6 million US dollars per Kilometre on an average. Routine maintenance of this road costs about 10.000

US dollars per year per Kilometre. If the maintenance is neglected, it will cost five or six times as much to restore the road. Economically, it is an indefensible waste. If money is short, and it usually is, there is only one rational course of action:

- Maintain existing roads before funding new ones
- Make sure it is done today, and every day. Tomorrow it will be much more expensive.

It is often forgotten that building of roads is only a part of the total transport cost. While this total costs includes maintenance and building costs, it also includes the full cost of running vehicles on a road, an expense that climbs rapidly as the surface starts to deteriorate.

It is essential to take the total transport cost into account when making decisions about your roads. You have to have a policy that reflects the economic realities.

Maintenance, funding and execution

Building a new road is a cost that you usually have to pay once, but the cost for maintenance has to be paid over and over again. As a road gets busier, maintenance costs increase. A long term funding plan for maintenance is therefore necessary. Traditionally, government borrowing and general taxation have been proving funds for maintenance. As we all know, there are many needs in a society for this money, like health care, education etc. Many countries are therefore looking at alternative, more regular sources for road maintenance, less vulnerable for competition from other public sectors.

It can be useful to link funds for maintenance to the level of road use. Many governments now expect users to pay for the use of a road, and by that treating the roads in a similar way to utilities such as electricity and telecommunications. Such user charges include fuel levies, vehicle licence fees and tolls.

Another approach could be to look at the private sector. Private companies could well invest in road maintenance if the benefits outweigh the costs. Many countries have introduced so called PPP-contracts, which means Public Private Partnership. That means a private company will do both planning, design, construction and maintenance of a road network for a certain number of years. However, only high traffic roads are suitable for this kind of contracts. Many roads in developing countries or countries in transition have not that heavy traffic that makes this method interesting.

Maintenance money needs to be secured on a regular base. One way to do this is to introduce road users charge, as the fuel levy and to create an autonomous Road Fund. Many African countries have established such a Road Fund. As an example I can mention Tanzania and Zambia.

Another example is Ethiopia. There a national road fund was established in 1997 to secure funds to maintain all the public roads. The major source of revenue is a fuel levy, paid directly to the Road Fund. That means that there is an extra charge of 12,5% on pump prices. It must be pointed out that the public accepted this fuel levy very quickly.

There is, however, a danger that when the government is in need of money, they will throw their eyes on the road fund and wish to use the money for other purposes. We have seen examples that this really happened.

Maintenance is unlikely to be needed all over at the entire length of the road at the same time. The secret is to apply maintenance at the right time and in the right place. If interventions are too early or too late, money could be wasted. In the case of a new road, its condition deteriorates slowly. Only light maintenance is needed.

After that time the road enters a critical phase, which may last for some years. As the running surface fails, re-sealing is needed before it is too late. Otherwise, extensive repairs costing up to 4 times as much are inevitable.

This sort of problems are typically seen in networks of any kind, where the weakest point compromises the integrity of the system and thus needs priority attention. So if a bridge or just only a few metres of a road is impassable, long stretches of perfectly good roads on each side, become useless.

Analysis of the problem

In spite of an increased awareness of the impact of neglecting road maintenance, there is still a reluctance to prioritise maintenance. The reason for this can be described in the following terms:

- Road maintenance is politically unattractive – new road construction and road rehabilitation are more “visible” and produce greater political prestige.
- Different Ministries have to struggle with the same type of questions and policies in their own field, e.g. education, health, housing, elderly care, environment etc.
- The Road Authorities have not been able to develop reasonable tools to predict the changes in maintenance standards resulting from different levels of grants.
- The Road Authorities have not been able to document the consequences of what will happen to the roads when there is a lack of funds.
- Working with maintenance is still looked upon even to day by professional people as a low status occupation
- Maintenance has not been looked upon by Universities as an intellectual subject and little R&D funds have been devoted to this area.

We can therefore experience questions like the following from politicians, the road users, funding agencies and even the road administration themselves:

- What is the economic motivation and output of the road projects and road maintenance activities?
- What are the costs of transportation in different road conditions?
- What is the suitability of the existing road network to meet the needs of traffic today and in the future?
- What are the financial needs for the road network, its parts or a separate road?
- What is the number of road accidents, their causes and their analyses?
- What are the costs for maintenance?

Transport costs have to be valued in the context of other infrastructure. A road serves little purpose if no one has a need to use it. Thus estimates of traffic flow are essential to assessment of transport investment. Transport is a sector - within which all other sectors operate and is thus in some form essential. However, all the different sectors have benefits which are hard or impossible to value. The decisions have, therefore, to be made in a complex, political and social environment.

In order to allocate money between different modes of transport and between construction and maintenance, one can use economic evaluation methods, where all the monetary impacts are included. They are usually transferred into economic criteria like net present value or internal rate of return, in order to be easier to compare. Non-monetary aspects have to be taken into account before finalising the decision.

For the decision maker to decide the overall funding needed for road maintenance and its social impacts, one has to bring in the users costs. By comparing between different levels of road conditions and the effect on road users costs, it is possible to obtain an optimal solution which is the most economic for the society. Usually the funding is not adequate for the optimal solution so the budget constraints have to be taken into account.

Road maintenance and rehabilitation, as mentioned earlier, was traditionally viewed as a mundane topic for second rated engineers. However, its importance is beginning to be recognised today in a changed context and with a changed concept. It should have a key position in preserving the value of the road asset, providing improved service to road users and contributing to environmental quality. In fact, during the life cycle of a road, the responsibilities and life styles of people, their travel demands as well as communities will change and the road network has to be adapted to the new circumstances.

The highway network of any country is a major public investment designed to support the national economy by enabling industry, business and commerce to transport goods and people. The investment itself is usually undertaken as a result of balancing the various competing costs and benefits. When developed, the road network is expected to meet the national objectives for road transport and at the same time minimise total life costs of facilities and the transport costs of goods and persons. Road infrastructure is thus a significant economic asset.

How to solve the problem

One of the reasons why we have these problems within the maintenance area, is the lack of a tool for proper communication between road administrations and decisions makers. The objectives of this analytical system should be:

- Improve the communication within the road administration
- Establish a decision-making model in the administration
- Prepare analytical material and methods
- Establish working communication lines between the road administration and the politicians

- Come up with simple and understandable facts
- Improve the communication between the users and the road administration about new road projects and the profitability of different projects
- Use public polls to achieve success and at the same time check the quality of the work in order to survey the opinion of the public.
- Show the influence of the road network quality in transport economic terms and demonstrate the economic effects of different projects.

Despite its complexity, the mission of a country's road administration is typically stated in broad simple term, e.g.: Effectively manage the transport system that serves the country. In addition, serving clients, delivering quality products, environment, the economy, and recognising the value of the employees are increasingly emphasised goals and add to the managerial dimension of a road administration mission.

In addition to these transport sector objectives, roads are often used to achieve social objectives which lie outside the road transport sector, for example to help implement a vision for the future. One historical manifestation of this tendency occurred at the beginning of the last century in the US when farmers were pulled out of the mud by paving roads.

In Norway we had the same situation in the beginning of the 1960s when the number of cars increased rapidly and many of our gravel roads were not able to tackle the growing traffic. The answer was a cheap bituminous pavement, oil gravel, which later was used with great success on the Turkana-road in Kenya

It is not only the lack of funding that has to be solved, but the decision makers want to be sure that the allocated funds to road maintenance are properly used in the most effective way. To ensure the adequate fulfilment of decisions made for the road sector, there must be:

- An established and up kept Legal and Institutional framework
- A clear definition of the role of the Ministry and the role of the Road Administration .
- A policy framework for the entire road sector.
- Stable funding for a longer term.
- Proper managerial process and procedures or guidelines for road maintenance.
- Improvement in the overall management of road maintenance activities.
- Competence-based education and training of human resources in the road sector.

A streamlined ministerial structure, clear roles and the decision making powers between all the players in the road sector affords several advantages. The first and foremost of these is the focus on matters that government does best, legal development, policy-making, including pricing and environmental policies, regulation, public service, safety and convenience, and enforcement. The second advantage is economic efficiency and flexibility. In the Ministry of Transport the public sector takes on only the client function and leaves service delivery, that means carrying out the work, to the Road Administration and also to the private sector. This sharing of responsibilities gives benefits to the entire society.

Good management and decision-support systems are necessary and must be developed. First one has to establish a maintenance standard for the different activities in the maintenance sector. This standard should be based on socio-economic effects of maintenance including the users costs. Then there is a need to establish a Road Data Bank and a Road Maintenance

Management System. These tools are needed to help decide when, where, and what should be done to keep the roads in economically efficient condition.

Recommendations

It is important to involve the local communities in the maintenance problems or should we instead say the maintenance challenges. Local communities are totally dependent on a good road system. Therefore should this be a local agenda of high importance. The Road Authorities should use time and effort to inform local politicians and businessmen on how to solve the maintenance challenge. It is interesting to see what is happening on places where it has been possible to create local actions about this. We have the same experiences in my country. Good functioning roads became an important issue in a local election. The result was that all the members in the local council were replaced by new local councillors with a more positive interest in roads. So it works to let this be a political issue.

To cooperate with the road users organisations have given good results in many countries in order to put the questions about maintenance in focus. The road users organisations represent a strong, influential group and should engage themselves in this mission. I have seen, however, in some cases that these organisations know too little about the reality of the problem. They should seek professional assistance from the maintenance engineers and use their technical skill in helping to come up with good arguments. The road authorities have often in these cases a difficult role, they have to keep their balance. On one hand they have to be loyal to their political superiors, on the other hand they have to share their knowledge with the users of the road systems they are responsible for.

What should be the role then of the Technology Transfer Centres?

The most important role I think is to share knowledge of maintenance methods and practices and to learn from each other's successes and mistakes. One engineer should be given the responsibility to devote his efforts entirely to this subject. There is a lot of work done within this area all over the world and much has been published especially in the recent years. As an example I could mention the cheap and simple methods that are developed in recent years for surfacing roads.

All this knowledge should be transmitted to the Road Authorities and to the people working in this area. I hope that the centres could organise seminars and conferences where the main topic should be what we are talking about here, the consequences of neglecting the maintenance of roads.

The presentation of the message should be different, depending on the participants. To professional people one should talk more about methods and practices. To decision makers and stake holders the message should be based on examples and consequences. A kind of an action for "enlightenment of the people" should be the objective of this effort.

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